Unnatural Causes Reversing the Trend

by Dr. Swannie Jett, DrPH, MSc
Health Officer
Florida Department of Health in Seminole County

Agenda

- Definition of Social Determinants of Health
- Health Equity v. Health Disparities
- Examples of Research
- Operationalizing Health Equity

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World Health Organization(WHO)

- Social Determinants of Health defined as the conditions in which persons are born, grow, live, work, and age, including the health care system
- Mostly responsible for health inequities– unfair and avoidable differences in health status
- Social Determinants of Health as well as race, ethnicity, sex, sexual orientation, age, and disability all influence health

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Healthy People 2020

- **Healthy Equity**:
  - Is the "attainment of the highest level of health for all people. Achieving health equity requires valuing everyone equally with focused and ongoing societal efforts to address avoidable inequities, historical and contemporary injustices, and the elimination of health and health care disparities."

- **Health Disparity**:
  - Is "a particular type of health difference that is closely linked with social, economic, and/or environmental disadvantage. Health disparities adversely affect groups of people who have systemically experienced greater obstacles to health, based on their racial or ethnic group, religion, socioeconomic status, gender, age, mental health, cognitive, sensory, or physical disability, geographic location, or other characteristics historically linked to discrimination or exclusion."

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Social Gradient

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Hurricane Katrina

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Pre-Katrina Prep

- Max Mayfield, Director of the National Hurricane Center (Aug. 27th)
- Mayor Nagin called for voluntary evacuation on Aug. 27th at 5:00 pm. Mandatory on 28th at 9:30 am
- Prediction storm surge would topple levee system and warned oil production in Gulf of Mexico would shut down

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Pre-Katrina Prep

- Residents refusal to leave due to money, property, access to transportation
- Residents died during Hurricane Ivan evacuation
- Louisiana Superdome a refuge of last resort
- 1 million people fled the city
- 100,000 remained with 20,000 in Superdome by evening of August 28th

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Effects of Hurricane Katrina

- August 29th at 11:00 pm Mayor Nagin described the loss of life as significant
- Fuel shortages, electricity, communication, no local news
- First deaths were reported after midnight on 28th while nurses were evacuating patients from a nursing home
- Six deaths were confirmed in the Superdome
- Louisiana Department of Health's official total was 1,464 people

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Superdome

- Approximately 30,000 population inside
- Squalid conditions, limited food and water, no public facilities, no air condition or medical services
- Rape cases and suicide from 50 feet
- Exterior and interior structure damage equaled $140 million
- Sept. 1-the facility was declared unsanitary
- Sept. 6-Mayor Nagin ordered a forced evacuation of everyone unless related to clean up efforts

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Health Effects

- Dehydration and food poisoning
- Hepatitis A
- Cholera
- Tuberculosis
- Contamination of food and drinking water
- LT General Russel Honore charged paratroopers for evacuation efforts

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Health Effects

- Soldiers helped 6,000 to evacuate
- 82nd Division medical treated 1,352 people and immunized 2,047
- September 3–42,000 people were evacuated from New Orleans
- Local hospitals triage 5,000 people with 200 remaining in the medical unit
- September 6–E. Coli was detected in the water supply
- CDC reported five people died from bacterial infections caused by toxic waters

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Hurricane Katrina Recovery Update

- 274,760 individuals approved for Individuals and Households Program
- 216,558 individuals and families have been approved for Housing Assistance totaling $851 million
- 134,915 Mississippians approved for $416 million in Other Needs Assistance (ONA)
- 2,545 temporary housing units remain in service

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Hurricane Katrina Recovery Update

- $895 million in Public Assistance
- $404 million in Education
- $130.2 million in Public Works
- $49.7 million Public Safety
- $54.4 million in Health Care
- $217 million in Public Infrastructure
- $40.2 million in Debris Removal/Emergency Protective Measures

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Health Report Card

Determinants	Data	Rank
Obesity	27.1%	37th
Deaths	10,802	49th
Cancer deaths	221.9	48th
Infant Mortality	9.9	49th
Children in Poverty	23.8%	48th
Occupational Fatalities	8.4	41st
Lack of Insurance	21.9%	48th

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GARAGE 1

The citizens who needed the greatest assistance were fragile. The burden of Health Care and Public Health for the disadvantaged populations in our society does not just lie within a community or a state, but, within our Nation.

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Stress and Social Exclusion

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Definitions

- Social and psychological circumstances can cause long-term stress
- Anxiety, insecurity, long self-esteem, social isolation and lack of control over work and home life
- Poverty, social exclusion have a major impact on health and premature death

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THE AMEN PROJECT

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Background

- Disparities have been found with regards to the diagnosis and treatment of CVD between African Americans, Latinos and non-Hispanic white males

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Disparities for African American Men

- African American men are less likely to be diagnosed with heart disease, but are 30% more likely to die from it than a non-Hispanic white man
- The reason for this disparity is lack of medical care due to:

Low income
No or little access to health care
Lack of health insurance
Unequal care from the caring physician
Lack of education

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Disparities for Latino men

- Heart disease remains the leading cause of death among Latino men:
  - 5.6% have Coronary Heart Disease
  - 3.1% have had a reported heart attack
  - 28.7% have high blood pressure
  - 79.9% have high cholesterol

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Background

- Underlying disparities for African American men include:

Invisibility Syndrome

Psychological Impact of Surveillance

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Invisibility Syndrome

- Defined as – a feeling of not being seen as a person of worth
- These feelings tend to result in:

  Personal stress

  Feelings of disregard and disrespect

  Ultimately creates an inner conflict within the individual

- Concern – stress management

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Psychological Impact of Surveillance

- Focuses on exposures to racism and the toll it takes on the psychological health of African American men
- Due to this surveillance, men are more likely to develop diseases such as:
  - Coronary heart disease
  - Cancer

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Theoretical Basis

- Program and evaluation designed around the Health Belief Model
- Group discussions focused to influence perceptions of seriousness and susceptibility, provide cues to action, highlight benefits, minimize barriers, and increase self-efficacy
- Surveys obtained the men's behaviors, beliefs, attitudes, and barriers

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AMEN Project Objectives

- By May 2009, 90% of the participants will know the risk factors for cardiovascular disease
- By May 2009, 90% of the participants will know basic the detrimental health outcomes of personal stress and anger
- By May 2009, 40% of the participants will adopt effective behaviors towards dealing with personal stress and anger issues
- By May 2009, 90% of participants will know how the impact of surveillance and the invisibility syndrome can affect their health

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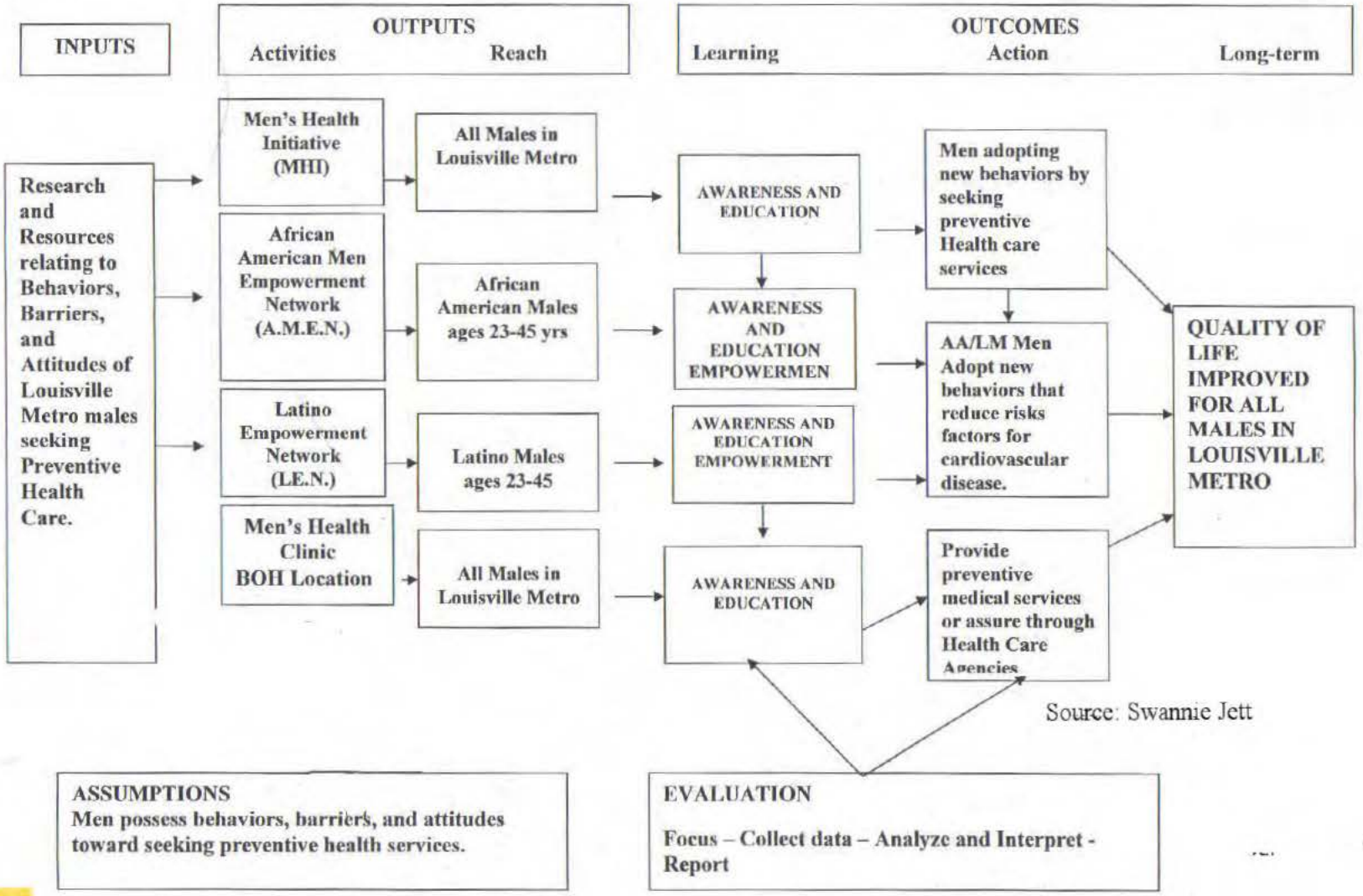
Logic Model

Situation: Eliminating Health Disparities associated with health care behaviors, barriers, and attitudes of Louisville Metro males



African American Men Empowerment Network

- Each week a new topic will be discussed. Topics include:

Invisibility syndrome
Anger and stress management
Mediation
Cancer prevention

- The support groups are formed in an effort to help participants:

Decrease CVD risk factors
Decrease CVD related morbidity
Increase anger and stress management skills
Increase healthy eating habits
Increase anger awareness

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Evaluation Design

- Intervention population: African American men ages 23-45
- Location
  - Dismas Charities (12th & oak street)
- Formative Evaluation
- Group Discussion with 11-13 participants
- Meet for 1-2 hours

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Recommendations

- Expanding to community organizations such as churches, schools, shelters, and work places
- Further testing of surveys to ensure reliability
- Incorporating data from multiple sessions to give larger sample size
- Men's dietary habits changed
- Reduction in stress levels
- Anger management increased by participants

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Transport & Environmental Justice

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Environmental Exposure and Cardiovascular Disease Prevalence in West End Louisville: Is there an Association?

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Introduction

- In early 1996 in Louisville, KY, the West Jefferson County Community Task Force (WJCCTF) was formed to focus on environmental justice issues
- The WJCCTF believed West End Louisville (WEL) residents were disproportionately burdened by air pollution emissions from Rubbertown Industrial Area (RIA).
- WJCCTF collaborated with U of L for EPA grant. These efforts became known as the West Louisville Air Toxics Study (WLATS) and have been continuously funded since 2001.

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Introduction

- American Synthetic Rubber Co.,
- ATOFINA Chemicals Inc.,
- Borden Chemical Inc.,
- Carbide Industries LLC., i.e.
- DuPont de Nemours and Company,
- DuPont Dow Elastomers L.L.C.,
- Noveon Inc.,
- Oxy Vinyl's,
- Poly One,
- Rohm & Haas Co., and Zeon Chemicals LP.

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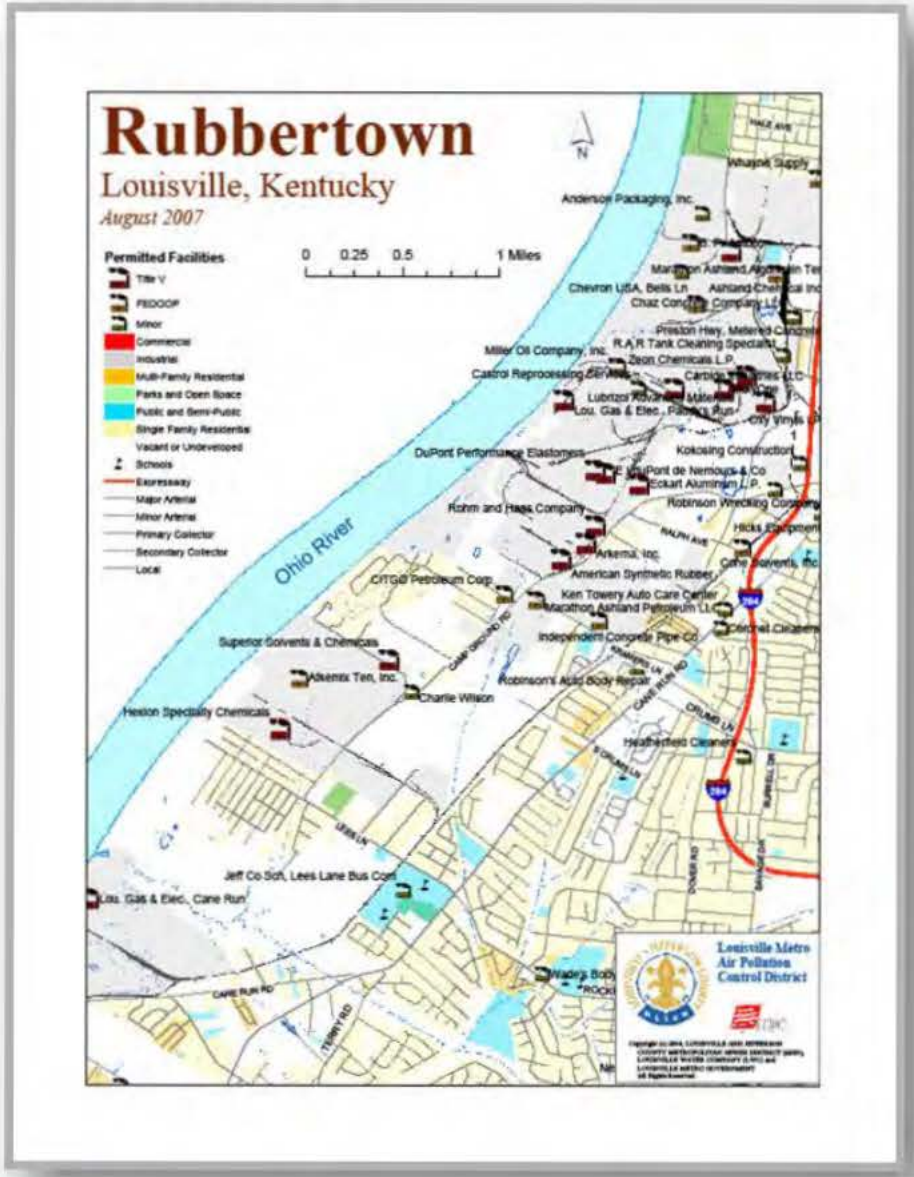
Investigation

- WLATS's intent was to investigate if residents were unequally burdened by air pollution emissions in RIA. Study period was from 2001-04
- Science International conducted a risk assessment from the WLATS and found *1, 3 butadiene, carbon tetrachloride, and acrylonitrile* presented the greatest health risk to individuals living near RIA



Purpose

To explore if WEL residents were probably exposed to greater levels *1,3 butadiene, carbon tetrachloride, and acrylonitrile* compared to EEL residents and determine if that exposure was associated with a higher CVD prevalence

Objectives

1. Determine the CVD prevalence in WEL and EEL

2. Determine the levels of *1,3 butadiene, carbon tetrachloride, acrylonitrile* in WEL and EEL

3. Determine the association between CVD prevalence and *1,3 butadiene, carbon tetrachloride, acrylonitrile* in WEL and EEL

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Study Population

- Health survey data – Residents were randomly selected from a list of phone numbers generated for the control group and comparison group. A cross sectional survey asked the phone interviewee the following questions:
  - Their proximity to RIA
  - If they had any diseases or disorders in the categories of cancer, cardiovascular, liver, kidney, and diabetes
  - There were 302 residents in WEL zip codes 40211 and 40216. In the comparison group there were 306 respondents for EEL zip codes 40213, 40214, 40218, and 40219. Total sample size was 608 respondents.

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Study Population

- The number of people eligible in the WEL was 24,365 and EEL was 23,187. A total of 9,470 attempts were dialed on 3,109 different numbers. Of these attempts:
  - 117 lived in other than targeted zip code
  - 76 unable to speak English
  - 35 were businesses
  - 407 were not in service
  - Respondents reported 251 CVD events, and 100 diabetes events

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Methodology

- Similar to EPA's ASPEN Model
- WLATS – baseline data was used for 1, *3 butadiene, carbon tetrachloride,* and *acrylonitrile*
- Meteorology data – accounted for wind rose, direction, and wind speed. Wind factors for each zip code was assigned based on wind frequency to Site E (Shelby Campus). Then the concentration as a function of distance was calculated.
- Receptor data – include health survey data

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Methodology

Exposure Assessment

- WLATS 2004 average values for each pollutant at each site
- Center of each WEL site was measured from a map along with the estimated directions of EEL zip code.
- The distance from each EEL zip code to each center of WEL zip code was measured.
- The distance from each point source to each EEL zip code was measured.
- The wind rose and distance factors was calculated and combined with Site E (WLATS) to estimate EEL exposure levels. The wind direction was measured by calculating the nearest two angles from the wind rose while taking a weighted average of the wind frequency from these two angles to estimate wind frequency for that precise direction.

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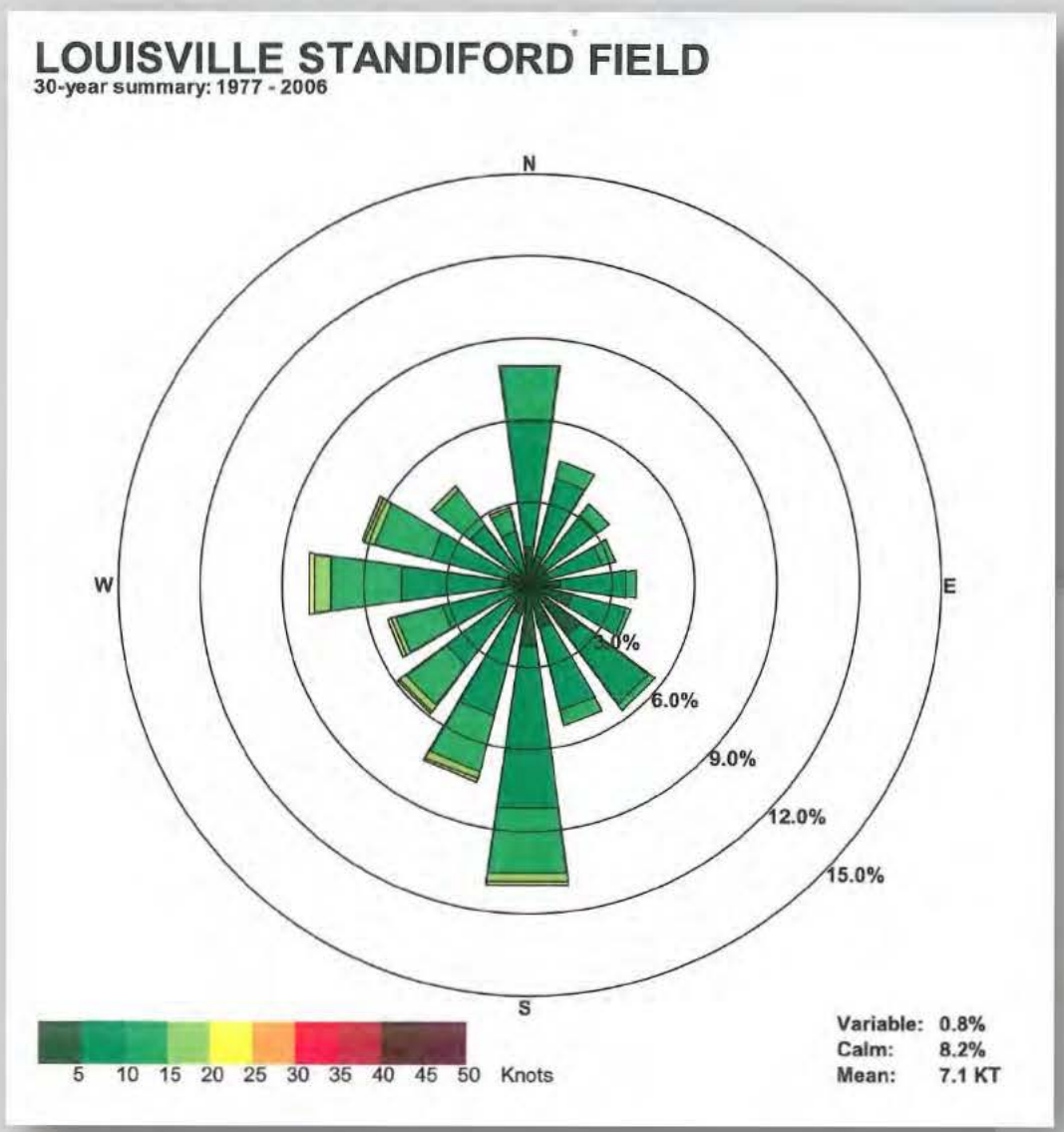

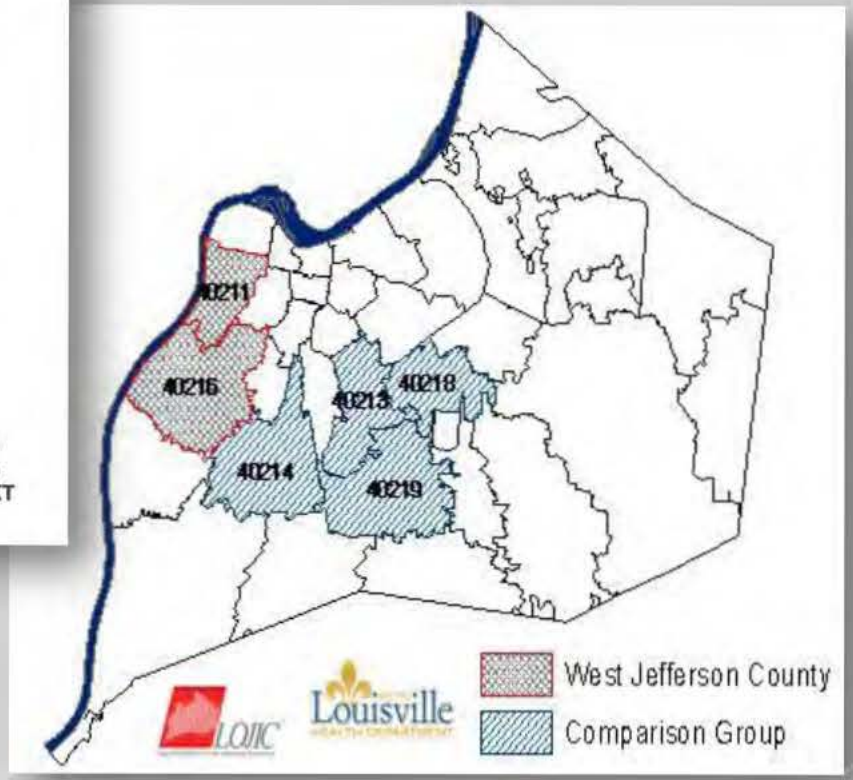

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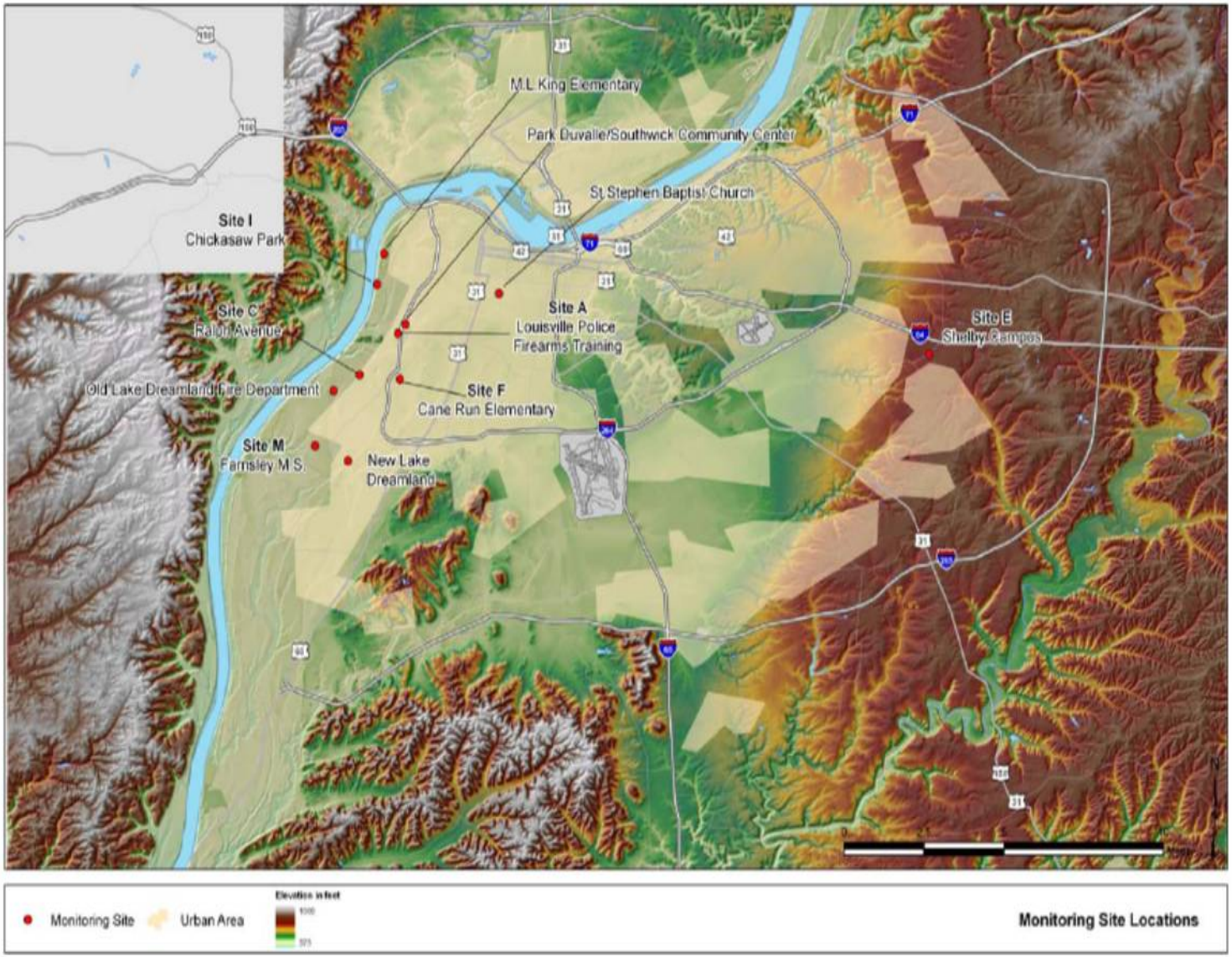

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Methodology

- The last step was to multiply both factors times the exposure level at Site E. The equation is:
- Exposure = ExposuresiteExDxFxWF
- DistanceFac = D/DSiteE
- WF = WF/WFsiteE
- For example: the angle for zip code 40213 is 25.7 degrees. This lies between the angles 22.5 degrees and 45 degrees given the wind rose, but instead of taking the average value of 6.1% and 4.7%, the weighted average was found. The angle of each zip code was determined from the estimated location of the pollution point source
- Weightedaverage = .061(45-25.7)/(45-22.5) + .047(25.7-22.5)/(45-22.5)

Key assumptions:

- Site E is east of the point source
- Exposure is directly proportionate to wind frequency.
- Exposure concentration is a function of distance

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Results

Table 3.0 Demographic summary of EEL and WEL residents by age, education, health insurance, gender, race, CVD, and diabetes in 2004

	EAST		WEST		
	N=300	%	N=305	%	P value
Age (years)					0.103
19-25	10	3	12	4	
26-35	32	11	24	8	
26-35	64	22	41	13	
46-55	67	22	82	27	
56-65	52	17	59	19	
65+	75	24	87	29	
Education					0.033
Elementary	8	3	4	1	
Some High school	31	10	31	10	
High school Graduate	103	34	131	43	
Some College	90	30	96	31	
College Graduate	68	23	93	14	
Health Insurance					
Yes, current	247	82	253	83	0.774
No	55	18	53	17	
Gender					
Male	85	28	70	22	0.136
Female	217	72	236	78	
Race					
White	210	70	175	57	0.001
African American	73	25	122	40	
Other	16	5	8	3	
Cardiovascular disease					
Yes	106	35	145	47	0.002
No	196	65	161	53	
Diabetes					
Yes	38	13	62	20	0.011
No	264	87	244	80	

CVD and diabetes is self-reported "Yes". Insurance is self-reported "Yes" if they have current health insurance. There are three missing values in data set.

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Results

Table 4.0 Cardiovascular disease outcome comparing crude and adjusted odds ratios for age, race, education, smoking, and health Insurance

Covariates	Crude OR	95% CI		Adjusted OR	95% CI	
Age	1.05	1.03	1.06	1.04	1.03	1.05
Race African American (ref=White)	1.30	0.92	1.84	1.90	1.34	2.98
Education (ref=Elementary)	0.75	0.63	0.89	0.85	0.70	1.05
Smoking Yes (ref=No)	1.09	0.79	1.51	1.07	0.75	1.54
Health Insurance No (ref=Yes)	2.06	1.30	3.25	1.26	0.76	2.10

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Results

Table 6.0 Estimated chemical exposure levels of 1, 3 butadiene, acrylonitrile and carbon tetrachloride for EEL and WEL.

		Air Pollutant		
Exposure by Zip code		1,3 butadiene	Acrylonitrile	Carbon Tetrachloride
East End	40219	0.1	0.09	0.32
	40218	0.14	0.12	0.44
	40214	0.43	0.39	1.39
	40213	0.22	0.19	0.69
West End	40211	1.75	0.43	0.48
	40216	2.83	0.26	0.55

note: mean estimates of exposure for East End zip codes were extrapolated and discussed in chapter 3. For 1, 3 butadiene the TLV is 4.5 $\mu g/m^3$,acrylonitrile TLV is 4.3 $\mu g/m^3$ and carbon tetrachloride the TLV is 31.35 $\mu g/m^3$. Units of exposure are in $\mu g/m^3$

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Results

TABLE 7.0 Crude analysis of 1, 3 butadiene and cardiovascular disease (CVD)

Pollutant	Prevalence of cardiovascular disease							
1,3 butadiene	No		Yes					
levels	N	%	N	%	Total	OR	95%	CI
0.1	70	65	37	35	107	1		
0.14	25	60	17	40	42	1.29	.62	2.68
0.22	32	65	17	35	49	1.01	.49	2.05
0.43	69	66	35	34	104	0.96	.54	1.70
1.75	32	41	47	59	79	2.78	1.52	5.07
2.83	129	57	98	43	227	1.44	.89	2.32
Total	357	59	251	41	608			

Note: This chart shows the mean value of 1,3 butadiene exposure for each zip code

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Conclusion

- African-Americans had significantly higher odds of CVD (OR: 1.86, CI: 1.24, 2.79) than Whites. Smoking and education was a not predictor for prevalent CVD.
- *1,3 butadiene* was not a significant predictor of CVD.
- WEL residents were exposed at higher levels of *1,3 butadiene* than EEL residents.

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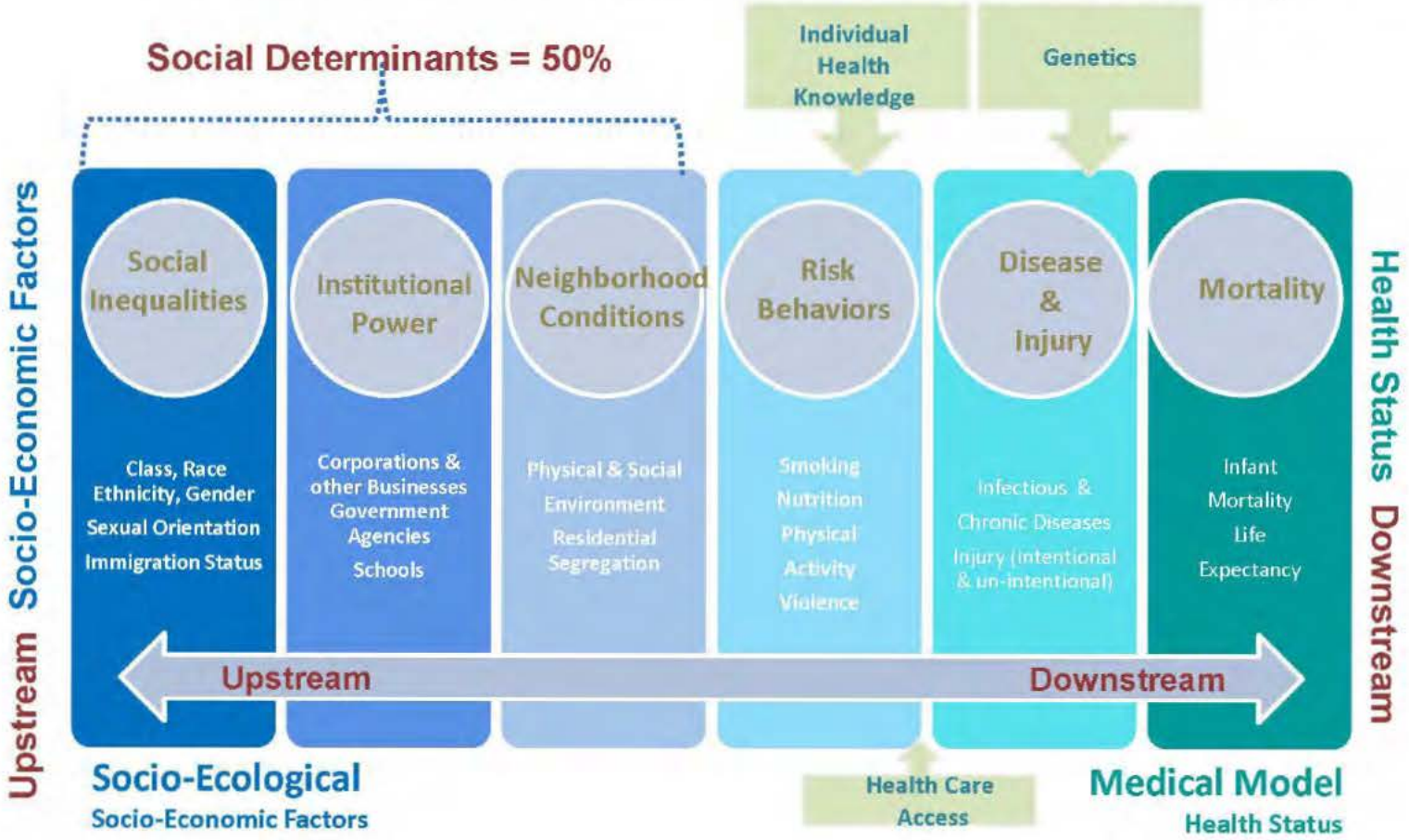
Framework For Public Health & Equity



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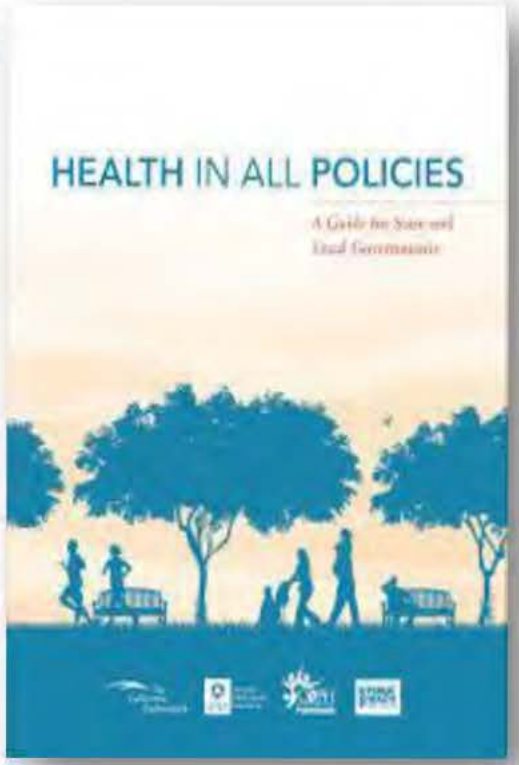
Promoting Health Equity

- Equity access to Healthy Foods
- Childhood Obesity
- Healthy Seminole Collaboration
- GIS Mapping of health inequities
- Health in All Policies (HiAP)
  http://www.phi.org/resources/?resource=hiapguide



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Promoting Health Equity

- Leadership
- Alignment of organizational and legislative policies to support health equity
- Establish stable funding through budget process
- Direct contact with policymakers (policy) and elected officials (Policy)

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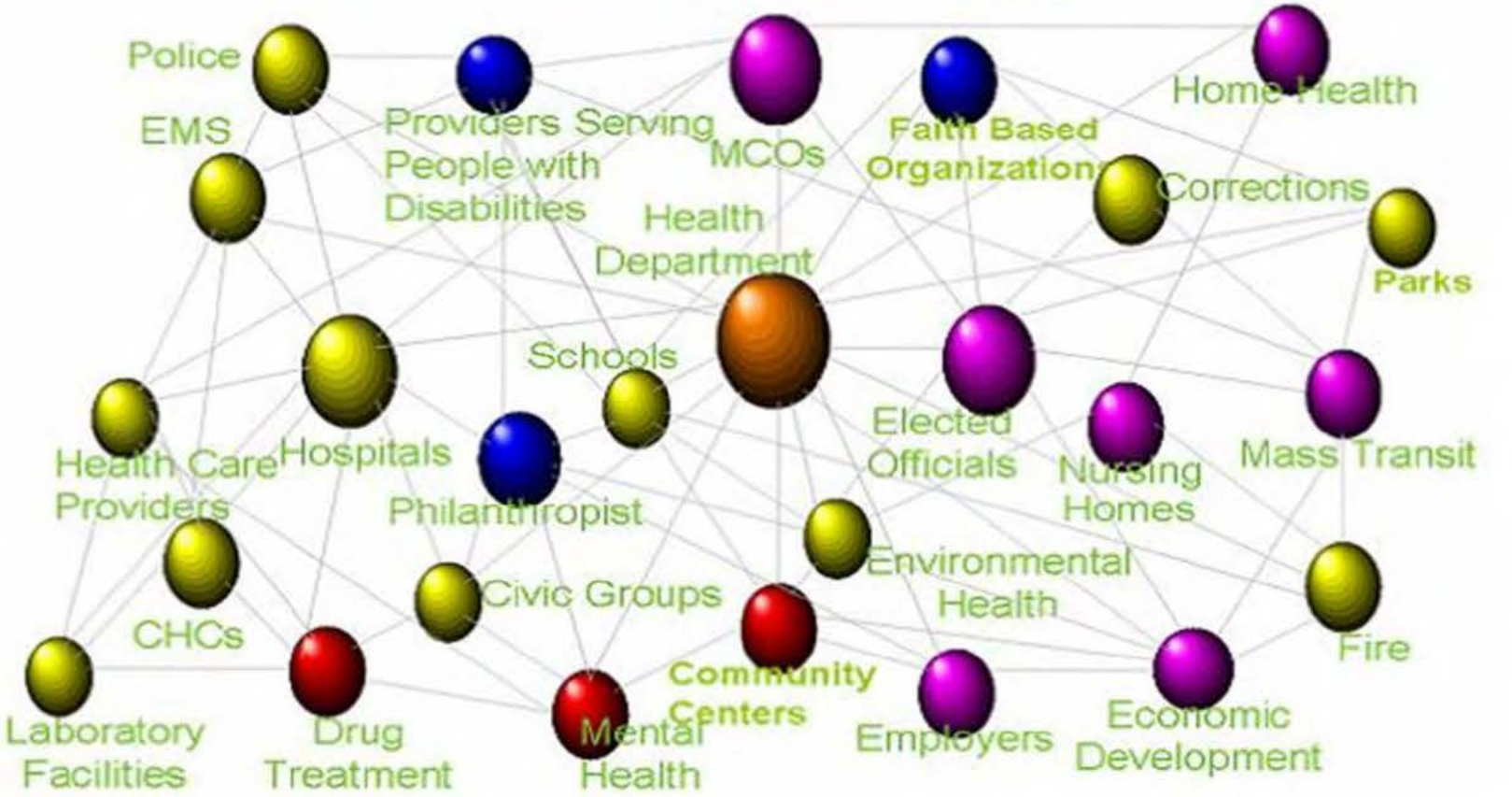
Local Public Health System



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Dr. Swannie Jett, DrPH, MSc,
Health Officer
Florida Department of Health in Seminole County
Phone (407)665-3200
400 W. Airport Blvd.
Sanford, FL 32773